IN THE CLAIMS

Please amend the claims as set out in the following claim listing, in which insertions are indicated by underline and deletions are indicated with strikethrough or by double brackets. Please add new claim 4. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An automatic parking brake system, comprising:

a casing having a slide bore formed therein, said slide bore including an enlarged diameter portion, a reduced diameter portion, and a ramped annular latching step interconnecting the enlarged diameter portion with the reduced diameter portion;

a parking piston which is slidably fitted into the slide bore of the casing, wherein the casing has a parking control fluid pressure chamber defined therein between a rear face of the parking piston and the casing, said parking piston configured and arranged so that a parking brake state can be obtained by forward movement thereof in response to a parking control fluid pressure acting on the parking control fluid pressure chamber;

a lock mechanism having a lock piston which is slidably fitted into the casing so as to be capable of advancing or retreating relative to the parking piston, wherein said lock mechanism has a parking release control fluid pressure chamber defined therein between a front face of the lock piston and the casing, and said lock piston is urged forward by a spring, said lock mechanism further comprising:

a cylindrical retaining tube integrally and coaxially connected to a rear part of the parking piston and having a hollow bore formed therein;

a plurality of spheres retained at a plurality of positions in the peripheral direction of the retaining tube so that the spheres can move along the radial direction of the retaining tube;

and an insertion shaft inserted into the retaining tube so that the insertion shaft can move axially relative to the retaining tube, said insertion shaft connected integrally to the front end of the lock piston so as to be in contact with the spheres from the inside of the retaining tube;

[[and]] wherein the lock mechanism is configured and arranged to automatically lock in response to forward movement of the parking piston in order to mechanically lock the parking piston at a forward position and to unlock in response to a parking release control fluid pressure acting on the parking release control fluid pressure chamber;

a fluid pressure source;

and a fluid pressure control mechanism for controlling a fluid pressure generated by the fluid pressure source so that the parking control fluid pressure and the parking release control fluid pressure can be obtained and separately controlled;

wherein the insertion shaft is formed by coaxially and integrally connecting a front small diameter shaft portion and a rear large diameter shaft portion via a tapered step that is capable of changing the position of contact of each of the spheres between the small diameter shaft portion and the large diameter shaft portion;

the small diameter shaft portion being in contact with each of the spheres so as to be capable of putting each of the spheres in rolling contact with an inner face of the small diameter hole portion in a state in which the parking piston is at a retreat limit, and the large diameter shaft portion being connected coaxially to the small diameter shaft portion so as to be capable of pushing each of the spheres outward along the radial direction of the retaining tube in order to make the spheres contact the large diameter hole portion in response to the parking piston moving forward from the retreat limit and the lock piston moving forward.

2. (Currently Amended) ~~The automatic parking brake system according to Claim 1,~~

An automatic parking brake system, comprising:

a casing having a slide bore formed therein;

a parking piston which is slidably fitted into the slide bore of the casing, wherein the casing has a parking control fluid pressure chamber defined therein between a rear face of the parking piston and the casing, said parking piston configured and arranged so that a parking brake state can be obtained by forward movement of the parking piston in response to a parking control fluid pressure acting on the parking control fluid pressure chamber;

a lock mechanism having a lock piston which is slidably fitted into the casing so as to be capable of advancing or retreating relative to the parking piston, wherein said lock mechanism has a parking release control fluid pressure chamber defined therein between a front face of the lock piston and the casing, and said lock piston is urged forward by a spring, wherein the lock mechanism is configured and arranged to automatically lock in response to forward movement of the parking piston in order to mechanically lock the parking piston at a forward position and to unlock in response to a parking release control fluid pressure acting on the parking release control fluid pressure chamber;

a fluid pressure source;

and a fluid pressure control mechanism for controlling a fluid pressure generated by the fluid pressure source so that the parking control fluid pressure and the parking release control fluid pressure can be obtained and separately controlled;

wherein:

the lock piston of the lock mechanism is positioned at the rear side of the parking piston so that a forward urging force acts on the lock piston at least when the parking piston moves forward, and is provided so as to allow a parking release control pressure to be made to act on the lock piston toward the rear,

and the lock mechanism further comprises:

a cylindrical retaining tube integrally and coaxially connected to a rear part of the parking piston;

a plurality of spheres retained at a plurality of positions in the peripheral direction of the retaining tube so that the spheres can move along the radial direction of the retaining tube;

and an insertion shaft inserted into the retaining tube so that the insertion shaft can move axially relative to the retaining tube, said insertion shaft [[and]] connected integrally to the front end of the lock piston so as to be in contact with the spheres from the inside of the retaining tube;

wherein the casing has a large diameter hole portion formed therein having a larger diameter than that of the retaining tube, and a small diameter hole portion being formed on an inner face thereof between the parking piston and the lock piston so that a forward-facing annular latching step is interposed between the large diameter hole portion and the small diameter hole portion, the small diameter hole portion being formed so as to have a smaller diameter than that of the large diameter hole portion, configured to slidably receive ~~and be able to be inserted into~~ the retaining tube therein, and being disposed to the rear of the large diameter hole portion;

and wherein the insertion shaft is formed by coaxially and integrally connecting a front small diameter shaft portion and a rear large diameter shaft portion via a tapered step that is capable of changing the position of contact of each of the spheres between the small diameter shaft portion and the large diameter shaft portion;

the small diameter shaft portion being in contact with each of the spheres so as to be capable of putting each of the spheres in rolling contact with an inner face of the small diameter hole portion in a state in which the parking piston is at a retreat limit, and the large diameter shaft portion being connected coaxially to the small diameter shaft portion so as to be capable of pushing each of the

spheres outward along the radial direction of the retaining tube in order to make the spheres contact the large diameter hole portion in response to the parking piston moving forward from the retreat limit and the lock piston moving forward.

3. (Currently Amended) The automatic parking brake system according to either Claim 1 or Claim 2, further comprising a brake caliper having an adjustment mechanism [[is]] provided therein, said brake caliper having a brake fluid pressure chamber formed therein, a brake piston being slidably fitted into a cylinder hole of the brake caliper and having a rear face facing the brake fluid pressure chamber,

the adjustment mechanism comprising:

an adjustment nut connected to the brake piston so that relative rotation is not possible and housed in the brake fluid pressure chamber, an adjustment bolt having a front end part screwed into the adjustment nut, a relay piston disposed in a rear part of the brake fluid pressure chamber and slidably fitted into the brake caliper in a liquid-tight manner so that the relay piston cannot rotate around the axis but can move in the axial direction, and a small piston integrally and coaxially connected to a rear part of the adjustment bolt, slidably fitted into the relay piston in a liquid-tight manner, and resiliently urged in a direction in which the small piston frictionally engages with the relay piston, the parking piston abutting against the relay piston from the rear side and being slidably fitted into the casing connected to the brake caliper and the lock mechanism being provided within the casing to the rear side of the parking piston.

4. (New) An automatic parking brake system, comprising:

a casing having a slide bore formed therein;

a parking piston which is slidably fitted into the slide bore of the casing, wherein the casing

has a parking control fluid pressure chamber defined therein between a rear face of the parking piston and the casing, said parking piston configured and arranged so that a parking brake state can be obtained by forward movement of the parking piston in response to a parking control fluid pressure acting on the parking control fluid pressure chamber;

a lock mechanism having a lock piston which is slidably fitted into the casing so as to be capable of advancing or retreating relative to the parking piston, wherein said lock mechanism has a parking release control fluid pressure chamber defined therein between a front face of the lock piston and the casing, and said lock piston is urged forward by a spring, wherein the lock mechanism is configured and arranged to automatically lock in response to forward movement of the parking piston in order to mechanically lock the parking piston at a forward position and to unlock in response to a parking release control fluid pressure acting on the parking release control fluid pressure chamber;

a fluid pressure source;

a fluid pressure control mechanism for controlling a fluid pressure generated by the fluid pressure source so that the parking control fluid pressure and the parking release control fluid pressure can be obtained and separately controlled;

and a brake caliper having an adjustment mechanism provided therein, said brake caliper having a brake fluid pressure chamber formed therein, a brake piston being slidably fitted into a cylinder hole of the brake caliper and having a rear face facing the brake fluid pressure chamber,

the adjustment mechanism comprising:

an adjustment nut connected to the brake piston so that relative rotation is not possible and housed in the brake fluid pressure chamber, an adjustment bolt having a front end part screwed into the adjustment nut, a relay piston disposed in a rear part of the brake fluid pressure chamber and

slidably fitted into the brake caliper in a liquid-tight manner so that the relay piston cannot rotate around the axis but can move in the axial direction, and a small piston integrally and coaxially connected to a rear part of the adjustment bolt, slidably fitted into the relay piston in a liquid-tight manner, and resiliently urged in a direction in which the small piston frictionally engages with the relay piston, the parking piston abutting against the relay piston from the rear side and being slidably fitted into the casing connected to the brake caliper and the lock mechanism being provided within the casing to the rear side of the parking piston.